

MERIT

Tan House Footbridge, Berkshire

PROJECT TEAM

Designer: Format Engineers Ltd

Structural Engineer: Format Engineers Ltd and WSP

Main Contractor: Balfour Beatty

Client: Network Rail



Tan House Footbridge is a 53m-long, triple-span crossing over a busy railway in Wokingham. Completed in November 2024, the 5m-high structure replaces two obsolete pedestrian bridges and connects parkland with a new residential development. Its design combines a distinctive architectural form with low-carbon construction and demanding railway logistics.

The bridge comprises a stiffened U-frame deck suspended from fan-shaped columns, with 14m-long stair structures at each end. This unusual arrangement creates a slender and visually porous crossing, allowing users to see the trains below while maintaining a strong sense of enclosure and safety.

Structural steel was selected for its economy, slenderness and compatibility between new and repurposed members. The design uses a high proportion of recovered steel that might otherwise have been treated as waste, reducing demand for newly manufactured material while demonstrating how reclaimed sections can be incorporated into permanent railway infrastructure.

Available repurposed sections had different sizes and profiles from those typically used in conventional bridge design. Parametric digital tools assessed the stock and refined the structural form around the sections' dimensions and properties. This allowed the design to respond directly to the material available rather than requiring sections to be manufactured to a predetermined arrangement.

Using repurposed steel required research, procurement controls and material testing to demonstrate its suitability. The recovered members were combined with new steelwork within a coherent structure, proving that a bespoke, site-specific bridge could remain practical and economical while achieving a substantial carbon reduction.

The completed structure achieved a SCORBS rating of A, equivalent to 639kgCO₂e per functional area. Its embodied carbon is considerably lower than that of standard railway footbridges, establishing a benchmark for future infrastructure projects.

The project demonstrates that a site-specific architectural design can reduce both capital costs and embodied carbon while remaining commercially competitive with standard railway footbridge designs.

Construction was governed by the restricted railway boundary and short, pre-planned possessions. Large prefabricated elements were delivered by rail, but had to remain small enough to pass beneath existing bridges along the route. The sections were then lifted rapidly into position during narrow line closures, reducing work beside the operational railway.

Tan House Footbridge demonstrates how material reuse, digital design and prefabrication can deliver architectural quality within a tightly controlled infrastructure environment. Its fan-shaped steel structure provides a significant improvement on the former crossings, while the research and lessons developed through the project are informing wider industry publications and future bridge designs across railway infrastructure.

JUDGES' COMMENT

“ Tan House Footbridge combines innovation, efficiency and architectural quality, creating an elegant, visually porous fan-shaped structure using repurposed steel with the design adapted to suit the available sections. Delivered within tight railway constraints, the bridge was transported by rail and installed during a short possession. ”